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## INFORMATION REPORT INFORMATION REPORT

## CENTRAL INTELLIGENCE AGENCY

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[REDACTED] report containing miscellaneous information  
on various aspects of scientific research in Czechoslovakia [REDACTED]

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C-O-N-F-I-D-E-N-T-I-A-L

COUNTRY: Czechoslovakia

DATE: 13 May 1958

SUBJECT: Miscellaneous Information Concerning  
Scientific Research

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3. A laboratory for low temperature research was established in the Institute of Technical Physics in the second half of 1957. [redacted]

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[redacted] the degree with which it would be used in conjunction with semi-conductor research. [redacted] other institutes had facilities for research activities in this field; [redacted] the Military Technical Institute might conduct low temperature research but could not give any facts substantiating this opinion.

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4. The specialized field of the theory of the chemical bond of isolated molecules is represented in world literature by many publications and more and more attention has been devoted to it during recent years. The countries of the Soviet bloc are far behind the democratic countries in this field. Only a very few scientists in the Soviet Union, Hungary and Poland have the qualifications to make contributions in this field. For the most part, they only add a few additional details to results obtained previously by scientists of the free world. [redacted]

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[redacted] Syrkin (fnu) and Djatkina (fnu) [redacted] work in this specialized field in the Soviet Union; their names are familiar [redacted] from literature published in the Soviet Union. Their work was rather more empirical and semi-empirical than theoretical. In Hungary a group of scientists, working under the guidance of the theoretical physicist Gombas (fnu), adhered to a line of statistical theory which had not as yet produced any important results. The theoretical physicist Kolos (fnu) worked in this field in Poland. He was apparently guided by the publications of Western scientists. Professor Kockel (fnu) worked in this field in East Germany.

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Hundreds of scientists have achieved remarkable results in this field in the democratic countries. For instance, the radiological determination of crystal structures is, according to Western literature, unthinkable without close cooperation with scientists in the field of the theory of chemical bond. Recently, the importance of this cooperation has been realized by the Soviet bloc countries and research work in this specialty has been increased in the Soviet Union. [redacted] research has been directed in the wrong way; it was begun with the study of the hydrogen bond. [redacted] this was a much too complicated problem and could hardly be solved by scientists who did not have sufficient experience even with the basic problem of chemical bond. According to Soviet publications, N.D. Sokolov studied hydrogen bonds in the Soviet Union, mainly empirically and without profound theoretical interpretation. Judging from publications in world literature, [redacted] the United States is leading in this field, mainly because of the high-level achievements in the production and use of electronic high-speed computers. [redacted]

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[redacted] only  
ten percent of all literature in this field was published [redacted]

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[redacted] and that only approximately three percent of it originated in the Soviet bloc. A substantial part of Soviet bloc publications were written by Hungarian research scientists. In Czechoslovakia no research work was done on the theory of the chemical bond based on theoretical physics until 1956. At that time there were only very few physicists who were able to understand the basic principles of this theory; however, none did any actual research work in this field. Until 1957 [redacted] not [redacted] a single paper on this subject which was published by a Czechoslovak scientist. [redacted] the first scientist who began working in this field was Dr. J. Koutecky, now working at the Institute of Physical Chemistry of the Czechoslovak Academy of Sciences. Professor Doctor Zdenek Matyas, [redacted] was by far the foremost Czechoslovak scientist in this field. Professor Matyas began a series of lectures at Charles University in Prague which he called "The Electronic Structure of Molecules". Unfortunately, Professor Matyas died in June 1957. However, under his influence [redacted] other scientists, e.g., Dr. Josef Pliva from the Chemical Institute of the Czechoslovak Academy of Sciences and Dr. Emil Antoncik from the Institute of Technical Physics, began to work actively in this field.

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5. Czechoslovak solid-state physicists at the Institute of Technical Physics studying the possibility of production of artificial semi-conductors on the basis of the physical and chemical information of the constituents were: Dr. J. Tauc, Dr. M. Matyas and Dr. (fnu) Trousil in close collaboration with Dr. Antoncik. Dr. K. Smirous and Ing. L. Stourac worked on the technical aspects of this problem. [redacted]

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[redacted] Part of the research work by the above-named scientists has been described in the "Journal of the First Congress of Czechoslovak Physicists". The conference was held in Prague in 1957.

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